MELDAS

FR-SF Transistor Check

USA-E99651-046*

MITSUBISHI ELECTRIC AUTOMATION

USA

List of Revisions

Rev	Date of Revision	Detail	Author
*	9/29/09	First Edition	TSS

Purpose:

This procedure is used to check power base transistor (Inverter & Converter) on FR-SF series spindle control.

Overview:

This procedure is helpful when the machine has a Spindle Malfunction Error and the Spindle drive is displaying AL---32, 24 or 25. There are many conditions that can cause these alarms. By using the following steps, we can check the transistor and diode stack. The result of this test and motor test will allow the Engineer / Technician to determine what parts must be replaced or if the entire unit must be sent in for repair. Isolate the problem by using these troubleshooting techniques can also help determine if the spindle control power supply, base transistors, spindle motor fan, and any external devices are contributing factors for spindle alarm condition.

Parts Needed:

- Digital Multi Meter (FLUKE)
- Mega Ohm tester for motor
- Set of Philips screw driver.

Instructions:

I. Static check for Power Base Transistor

A. Static Check for Inverter Side Power Transistor

1. Disconnect motor leads from spindle drive at TB3 ***(see Fig-1)***

2. Wait 15-20mins to allow capacitors on the drive to discharge completely
3. Open the hinge panel that the SF-CA/CAA card and SF-PW (Power Supply) is mounted to. Behind the hinge panel are the components that make up the base unit for spindle drive. ***(Fig-1)***
4. Locate three base capacitors, on these capacitors are the P (positive right side) and N(negative left side) bus, together they supply DC bus voltage
5. Measure resistance between the points and enter your readings below:

+ (Positive)	-ve (Negative	Res-Readings
P— U	N---U	Ω
P--- V	N---V	Ω
P---W	N--- W	Ω

The resistance measured should be between 7KΩ ---- 70KΩ in normal conditions. Anything resistance reading measured below the specifications is considered to be bad. Note: Due to leakage voltage across P&N (DC bus Voltage), you might measure resistance in mega ohms range, this is OK. To avoid this condition, allow fifteen to twenty minutes after power is disconnected.

B. Static Check for Converter Side Power Transistor (Diode Packs)

1. Locate Magnetic Contactor, contactor is mounted to the left of motor terminal block(In most case)
2. Top side of Magnetic Contactor leads marked R3, S3, & T3. In some cases these leads/screw terminals are labeled X1/L1, X2/L2, & X3/L3
3. Measure resistance between the points and enter readings in Ohms below:

+ (positive)	-ve (Negative)	Res-Readings
P --- R3/X1/L1	N --- R3/X1/L1	Ω
P --- S3/X2/L2	N --- S3/X3/L3	Ω
P --- T3/X3/L3	N --- T3/X3/L3	Ω

After completion of the procedure contact Mitsubishi Technical Service and Support for further instruction.

Appendix: (Fig-1)

(1) FR-SF-2-5.5K, 7.5K, 11K